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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Piping Marshland Sur

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A SCIENCE SERVICE PUBLICATION



Adventurers in Research

Dr. Earl A. Gulbransen
SCIENTIST

A graduate of State College of Washington, Pullman, Washington, he received his Ph.D. from the University of Pittsburgh in 1934. He was a National Research Council Fellow in physical chemistry, and later a Research Associate at the University of California. For four years he was Instructor at Tufts College. In 1940 he came to the Westinghouse Research Laboratories as Research Engineer, and in 1947 was advanced to Advisory Engineer, his present post.

WHEN HE CAME to the Westinghouse Research Laboratories in 1940, Dr. Earl Gulbransen was given a challenging assignment. He was asked to initiate a program of fundamental research on the corrosion and oxidation of metals. A new approach was needed. Previous research had failed to solve the problems. Dr. Gulbransen, a physical chemist, was chosen to supply that new approach.

With complete freedom to proceed in any direction he saw fit, Dr. Gulbransen developed a host of new techniques and methods that have resulted in a better understanding of corrosion. He has a unique ability to apply physical tools to the study of chemical reactions. He developed a vacuum microbalance so sensitive that it can weigh a single layer of oxygen atoms . . . a special electron diffraction camera for the study of crystal structure of corrosion films at high temperatures . . . new applications for the electron microscope in the study of chemical reactions on solid materials.

The achievements of Dr. Gulbransen may also be measured by the many honors he has received and his 50 scientific papers published since the start of his research program. His latest honor was from the American Society of Corrosion Engineers, which, at its Spring

meeting of 1952, granted Dr. Gulbransen the Willis Rodney Whitney Award for his contributions to the knowledge of corrosion.

Dr. Gulbransen is a soft-spoken, friendly man with intense interests in both technical and cultural directions. He points out that the research in which he is engaged has tremendous social significance. "It is well known that our metal resources are diminishing," he says. "The pressure for these resources in the past has led to power politics and disastrous wars. Success in corrosion research and subsequent practice of protection of our metal resources can offer a real alternative to the pressing problems of mankind."

Dr. Gulbransen will tell you he considers fundamental research the most useful research. He explains that by gaining an understanding of the basic reactions involved between the simple gases and pure metal, an important step is taken toward ultimate solving of the problem of corrosion.

His contributions to science have been many. His practical solutions to problems have added greatly to our knowledge of metal processing, and have resulted in many improvements in Westinghouse products.

Westinghouse Electric Corporation, Pittsburgh, Pa.

G-10256

YOU CAN BE SURE..IF IT'S Westinghouse

MEDICINE

Susceptibility to Colds

Study of how colds spread naturally shows that whether or not you catch cold depends on how susceptible you are at the time of exposure.

► **WHETHER OR** not you catch cold depends more on how susceptible you are at the time the cold virus hits you than on the degree to which you are exposed to colds.

That this is "probably true" is the conclusion of the latest study reported by the Common Cold Research Unit at Harvard Hospital, Salisbury, England.

The unit, headed by Dr. C. H. Andrewes, has already shown that if the common cold virus is washed out of a cold victim's nose and dropped into another person's nose, that person may get a cold. Their latest study was undertaken to find how colds spread naturally.

Children were used as donors of colds in some of the experiments because there is some evidence that they spread colds more readily than grown-ups do. All the donors, whether child or adult, were selected because they had "wild" colds or natural colds of recent onset.

To see whether and how such colds would spread, the scientists used human volunteers in good general health who come to the hospital for these experiments. The volunteers are put in isolation for the first three days, to make sure they are not coming down with a cold before the experiment starts.

In one experiment a 2,000-cubic-foot room was divided in two by a blanket hanging within one foot of side walls, floor and ceiling. Five or six volunteers without colds sat in one side of the room reading or sewing. On the other side of the blanket the children with colds played games, talking, shouting or singing, but not moving around much. A fan kept the air moving throughout the room, and sneezing-powder was sprayed into it about half way through the two-hour experiment.

In this experiment, repeated with four groups of cold donors and four groups of cold-free volunteers, only two colds developed altogether in 25 volunteers. Broken down into groups, a group of six escaped colds from five adults, a group of five escaped colds from four children, one out of eight got a cold from a group of four children, and one out of six got a cold from four children.

In another trial, children and grown-ups with colds mixed freely with healthy volunteers, eating lunch together and later playing cards and other games. This time, three out of 32 volunteers developed colds.

Colds, the scientists conclude, can spread by normal social contact and through the air in infected droplets, but the rate of infection through these routes is low.

Indirect contact, such as hands, handkerchiefs and other objects, is not of major importance in spreading colds, other experiments showed.

The cold virus may be sensitive to drying, so that it will not infect if it is dry, still other experiments suggested.

Reporting these studies with Dr. Andrewes in *Lancet* (Oct. 4) are Drs. J. E. Lovelock, A. T. Roden, J. S. Porterfield and T. Sommerville.

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PHYSIOLOGY

Actual Sex Reversal Impossible for Humans

► **FOR HUMANS**, there is no such thing as actual sex reversal. Sex of experimental animals has been changed from male to female and vice versa, but this work has been done on embryos, and very young embryos at that.

Cases of sex "reversal," such as those re-

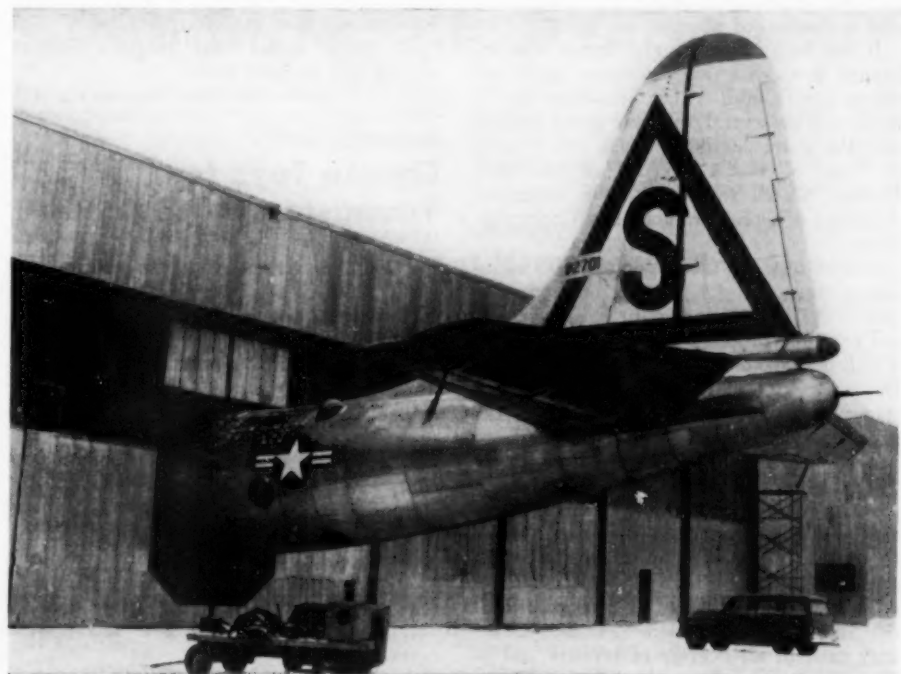
cently reported from England and Denmark, are really cases of mistaken identity. An individual's sex is determined by inherited sex chromosomes. The sex chromosomes carry the decision as to whether testes or ovaries will develop from the gonad, the sex gland.

By injecting male hormones in the embryos of experimental animals that from their sex inheritance should have been females, scientists have been able to change the females to males; and, by giving female hormones to genetically determined male embryos, the animals have developed as females. No doctor, of course, has been able to carry out such experiments on human fetuses, which is the only time when actual sex reversal could take place.

Later operations and treatment with hormones to change the sex of a person can change external sex characteristics. These include the voice, beard or lack of it, amount and distribution of hair, development of the breasts, etc. A male who has been changed to a female could probably marry, but would probably be incapable of child-bearing.

Sex repairs can be made to correct abnormal development, and in this way the individual is transformed from male to female, but one of the great difficulties is that an individual's psychology cannot be repaired. Such a need might not be recognized until the hormone injection and surgery treatments were completed.

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ALL-WEATHER BOMBER MAINTENANCE—New standardized, all-weather maintenance hangars for B-36's, designed by Luria Engineering Company, incorporate special features to enable U. S. Air Force personnel to perform around-the-clock repairs. The bomber's tail protrudes through a rubberized-tube door opening, which, when inflated, provides weather-tight protection around the fuselage.

PUBLIC SAFETY

Freak Accidents of 1952

► WHEN HIS single engine "conked out," a Salt Lake City aviator made an emergency landing on a busy highway. But his plane kept rolling on down the highway. It had landed on a car.

This was listed by National Safety Council Director Paul Jones as one of 1952's freak accidents. In an accident review of the year, published in the current issue of *Public Safety*, Mr. Jones also recounts these freaks:

1. In New York, a six-year-old boy plunged down a stairwell in his family's apartment house. He fell five floors and landed on a German shepherd dog named Prince. Neither boy nor dog were hurt seriously.

2. As it made a left turn, the car of an Indianapolis driver was struck by another car. Knocked into the path of a second vehicle, the car was hit again. The second crash spun the car around, causing it to smash into the car which struck it first.

3. An Air Force captain from Dallas,

Tex., fell out of the door of a C-46 cargo plane as it flew a mile high over Korea. Just as he was about to pull the rip cord of his parachute, the captain was scooped up by the plane as it hit an air pocket. He entered by the same door by which he had so recently left.

4. Near Meridian, Miss., a woman motorist saw something fall from a station wagon ahead of her. She stopped her car, picked it up and tried to catch the station wagon to return the driver's property. Believing that the car behind him wanted to play games, the station wagon driver gave a merry 15-mile chase. But finally the woman motorist was able to return to the couple in the station wagon their two-year-old son. He was not hurt badly from the fall.

5. A crane operator in the Portsmouth, N. H., Navy Yard leaned out of his crane to shout to a workman below. The operator's safety hat fell off, struck the man below and broke his nose.

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equipment are typical playthings that aid physical development.

2. Manipulative, constructive, creative play. Blocks, construction toys, drawing and painting equipment, and hobby kits are typical aids to this type of play.

3. Initiative, imaginative, dramatic play. Dolls, housekeeping equipment, train systems and dress-up costumes are typical of the kind of equipment that stimulate imitative and dramatic play.

4. Social play. Games in which several children can take part are essential aids to social development.

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GENETICS

Albino Inheritance Factor

► ALBINISM, AN abnormal lack of color in the skin, eyes and hair, affects from one in 5,000 to one in 25,000 of the population, and is distributed all over the world.

It has long been thought that it was inherited through a single recessive gene, but recent genetic studies have indicated that it is carried by several recessive genes and in addition some dominant genes. Dr. Harold F. Falls of the University of Michigan Medical School reported to the American Academy of Ophthalmology and Otolaryngology.

Recent research has suggested that albinism is the result of a disorder in the body's chemistry, in which certain substances do not combine properly to form the pigment which gives color to the eyes, skin and hair, Dr. Falls said. Because a number of substances are involved in the process, the degree of pigmentation varies widely from person to person.

The albino eye has a pink, translucent iris and red pupils, Dr. Falls explained. It may move involuntarily from side to side or up and down, and it is usually hypersensitive to light. The vision is defective, and the patient is likely to be near-sighted or unusually far-sighted. These factors may exist in all degrees of severity and in all combinations, he continued. Observation has shown, however, that as a person grows older, there is an accumulation of pigment, and his difficulties become less, including his poor vision.

The use of shields, tinted glasses, colored contact lenses and tattooing of the eyeball have all been tried in efforts to help the al-

bino to see better and to relieve his discomforts. These measures all help, but the most effective help has been obtained through the use of telescopic lenses, specially made lenses that magnify objects at least two or three times.

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PEDIATRICS

Choose Toys for Youngsters With Care

► FOR THE children on your Christmas gift list, select toys with care. Of course you want to give safe toys.

Avoid those with lead paint, sharp pointed toys for young children, and toys small enough to be swallowed in the case of babies and small children. Avoid, also, toys that break or come apart easily. Toys may be quite simple and yet delight the child.

Complicated gadgets will be looked at but usually not played with. If you watch a small child playing, you may see him taking the lid off a box and replacing it time after time. He is enjoying himself because he is gaining a new accomplishment.

A child learns and develops through his play. One authority on the subject advises giving the child a well balanced diet of toys and play equipment to help him to good all-round development. The four main courses on this balanced toy diet are:

1. Active physical play. Push and pull toys, wheel toys, balls, sports and gym

PSYCHIATRY

Emotions Play Lead in 40% to 60% All Illness

► DOCTORS SHOULD be as able to take care of their patient's minor emotional and mental upsets as they are to do minor surgery, such as taking care of cuts, boils and the like.

So declaring a Denver psychiatrist, Dr. Clarke H. Barnacle, at the meeting of the American Medical Association in Denver.

Emotional and psychological factors play a leading role in 40% to 60% of all illnesses, he declared. But the time to refer patients to a psychiatrist is when they have serious depressions, complicated psychosomatic illnesses, severe neuroses, delirious reactions and psychoses.

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PUBLIC SAFETY

How to Figure Safe Distance to Car Ahead

► A QUICK way to figure the safe distance at which to follow the car ahead of you has been reported to the Highway Research Board in Washington by Harrison Hill of the Connecticut Highway Department.

Divide your speed in miles per hour by 5. Multiply your answer by itself. Add to that your speed in miles per hour.

Thus if you are going 50 miles per hour, you should follow the car ahead of you no closer than 150 feet.

Mr. Hill suggests that drivers use telephone poles to help them estimate the distance between cars. Standard spacing of roadside telephone poles is about 125 feet, he said.

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TECHNOLOGY

Sulfur Obtained From Under Marshland**See Front Cover**

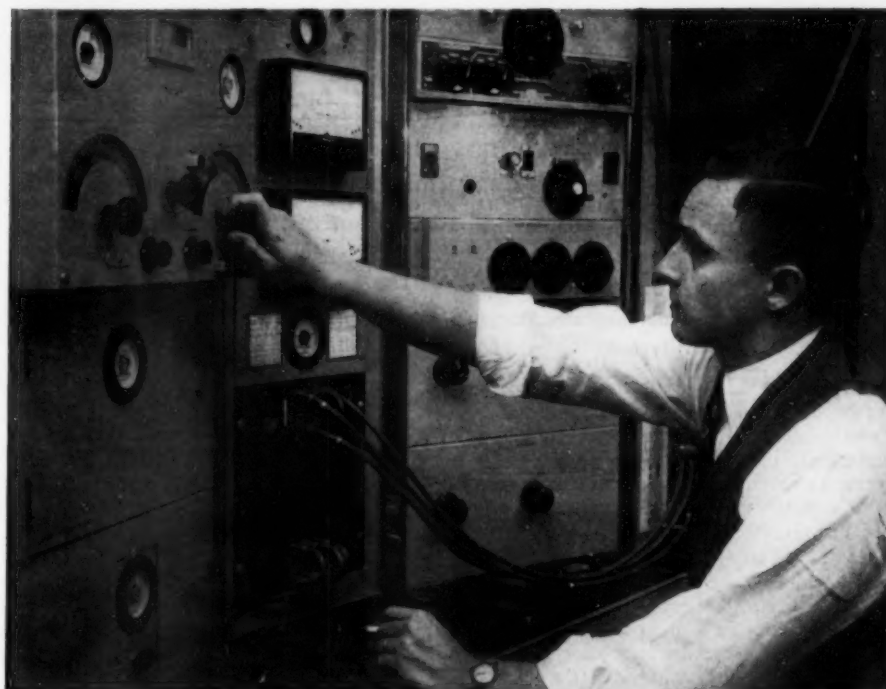
► SULFUR, ONE of industry's most important raw materials, is now being extracted from a deposit deep under the Bay Ste. Elaine in the Louisiana marshland, the Freeport Sulphur Company reported in New Orleans.

A water-borne plant pours nearly 2,000,000 gallons of hot sea water a day into the bed to melt the sulfur, which is then transported in insulated barges to storage 75 miles away. Only one of its kind, the plant will mine 100,000 long tons of sulfur per year.

The pipe-lines for transporting the marshland-mined sulfur are shown on the cover of this week's SCIENCE NEWS LETTER.

The new mining technique employed holds promise for the future development of similarly situated deposits.

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TESTING L-3 CABLE—An engineer tests transmission characteristics of the new coaxial cable system, known as L-3 carrier, capable of handling 1,800 telephone conversations simultaneously. It is the first system in which both television signals and telephone conversations can be sent over the same pair of coaxial pipes at the same time.

TECHNOLOGY

Coaxial Cable System

► ABOUT 3,600 persons soon will be able to talk to each other over a new coaxial telephone cable running between New York and Philadelphia.

Scheduled to go into operation in early 1953, the cable and its associated equipment can carry 1,800 separate conversations at once, or it can be set up to carry 600 calls and a television program each way, Bell Telephone Laboratories in New York have announced.

Called the L-3, the new telephone line consists of a pair of coaxial pipes buried within the cable. Each about the size of a pencil, the two tubes can handle three times more conversations than comparable present-day equipment.

The first cable ever to mix telephone calls with video programs, the L-3 can distribute the TV program to local television stations scattered along the cable's length. Special equipment prevents telephone conversations from interfering with the video programs, and vice versa.

The advanced design of the cable made it necessary for engineers to develop new amplifiers with better characteristics than those now in use. The amplifiers use more electric power than the old ones, and twice as many are required for a given length of the cable.

Coaxial cable is one of two types of facili-

ties used by the Bell system to carry TV programs. Radio relay, the other type, sharply focuses radio microwaves and beams them serially along a chain of relay towers.

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CHEMISTRY

Chemical Aiding Use Of Oxygen Synthesized

► THE CHEMICAL that comes right next to the central wheel of life and gets pushed by it has been created in the laboratory.

This vitally important chemical is a coenzyme called flavin-adenine-dinucleotide, or FAD for short. Its total synthesis is announced by Drs. S. M. H. Christie, G. W. Kenner and A. R. Todd of Cambridge University Chemical Laboratory in a letter to *Nature* (Nov. 29).

FAD is indispensable to the utilization of oxygen by almost any organism that requires oxygen for life. It attaches itself to various proteins and then takes on various functions, all of them related to utilization of oxygen.

FAD has previously been prepared by enzymic reactions, but this is the first time that it or any related coenzyme has been synthesized chemically.

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MARINE BIOLOGY

Red Tide Mystery

When water conditions are exactly right, a tiny, one-celled, plant-like organism multiplies enormously, producing a fish-killing poison whose chemistry is not yet known.

By DR. HAROLD J. HUMM

Director, Oceanographic Institute, Florida State University

► THE RED tide is not a tide and it is not really red. It is a term applied to an extremely abundant development of a tiny, one-celled, plant-like organism which secretes a poisonous substance into the water. Most scientists believe this organism is present, but relatively rare, in the waters of the Florida Gulf coast at all times.

But most of the time there are too few to have a harmful effect upon fish and other animals. Once in a great while water conditions reach a certain state that promotes the development of enormous numbers of these tiny organisms, and when this happens, the poison they produce becomes concentrated enough to kill.

The organism belongs to a group that is neither plant nor animal, but is intermediate in nature. However, it possesses chlorophyll as do true plants. Marine scientists classify it as a dinoflagellate, *Gymnodinium brevis*. It was first described by Dr. C. C. Davis of Western Reserve University, Cleveland, who studied it during the 1946-47 outbreak.

During autumn, water conditions off the lower west coast of Florida occasionally reach a certain, precise state that promotes the rapid development of *Gymnodinium brevis* that results in enormous numbers forming patches in the water, in which there may be 50 to 75 million per quart of water.

The water at first develops a yellowish hue which darkens to an amber color with a reddish tinge as the organisms increase. At the same time the water becomes remarkably thick and stringy.

Poison's Nature Unknown

While the conditions that promote the development of this organism in such numbers are not known, it is believed that rivers which drain phosphate-rich land of southwest Florida may be an important factor in view of the phosphates they contribute to the Gulf in the red tide area.

The chemical nature of the poison that red tide organisms secrete into the water is not yet known. It is believed to be a nerve poison. Fish are not killed by clogging of the gills or lack of oxygen. If asphyxiation is the cause of death, it is a result of the effect of the poison upon the nervous system and not because of mechanical interference with circulation of water through the gills.

The poisonous substance affects many other marine animals as well as fish. Invertebrates including barnacles, oysters, clams, shrimp and crabs are killed. There are reports that porpoises and sea turtles are also killed.

Toxicity of the water to man is shown by the nose and throat irritations that take place when an off-the-sea breeze prevails that exceeds 14 miles per hour. Under these conditions, droplets of red tide water are blown into the air and inhaled by persons ashore. While the irritation produced is not serious, its cause is clear.

Sea water from which the red tide organisms were strained was just as toxic to fish as water containing the organisms. It was by this procedure that scientists proved that the organisms excrete a poisonous substance into the water.

Despite the large numbers of fish killed, an estimated half billion during the 1946-47 red tide period, there is no acceptable evidence that a significant proportion of the population is killed to make a detectable reduction in the population of the affected area. It appears that the "loss of enormous numbers of game and food fish" is of no direct economic importance.

Discourages Tourist Trade

There is an economic loss, however, by the fact that tourists, Florida's major "industry," are driven away from the beaches while dead fish are washing ashore or decaying.

In addition, the fishing industry suffers a loss because the demand for fish may be reduced during the red-tide period, and fishing may be curtailed. During the current red-tide development, winds have driven the dead fish out to sea. During November, at least, not enough fish washed ashore to affect normal use of the beaches.

Authentic reports of the red tide along the Florida Gulf coast are on record for more than 100 years. It is probable that the same organism has been responsible for almost every outbreak. On the average, the red tide has occurred once each decade but its appearance is very irregular and unpredictable.

Phenomena similar to the red tide are known all over the world. In California, one form of it is annual and renders the sea mussels inedible each summer. Probably the majority of red-tide phenomena which have been studied has been caused by an organism belonging to the dinoflagellates.

Mariners in the past have often mistaken

discolored water for a shoal, which they reported to the hydrographic office as a menace to navigation, since it did not show on the chart.

The Florida red tide, if it behaves as before, may reappear during the winter. If this takes place, a thorough understanding of it should result, in view of the teams of scientists who are now in position to study it from every aspect.

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BIOCHEMISTRY

B Vitamins Play Role In Making Antibodies

► CERTAIN B vitamins play a significant role in the synthesis within the body of antibodies, the substances that help fight disease germs. The particular B vitamins for which such a role has been found are pyridoxine, pantothenic acid and pteroylglutamic acid.

Do not, however, rush out to buy a box of these vitamin pills with the idea of building up resistance to colds, influenza and the like.

How the findings are related to the general problem of nutrition and resistance or susceptibility to infection is not yet clear, Dr. A. E. Axelrod of Western Reserve University points out in reviewing his own studies and those of other scientists.

The problem will be cleared up, he says, when scientists show that the immune response to an infectious agent, or disease germ, is markedly affected in a given vitamin deficiency state, and that this change in immune response is a vital factor in determining the resistance and susceptibility to the infection.

Vitamin antagonists, Dr. Axelrod suggests, might also be used to check the undesirable synthesis of antibodies, for example, those to the Rh blood factor.

Whether or not scientists ever reach the stage of saying a certain vitamin should be prescribed to build resistance to a particular disease germ, the ability to control antibody production in experimental animals by the vitamin intake should, Dr. Axelrod states, "be a useful tool in the unraveling of the mechanisms of antibody synthesis."

Dr. Axelrod's comments on the vitamin-antibody relationship appear in *Nutrition Reviews* (Dec.).

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TECHNOLOGY

Floating Coverall For Submariners

► THE NAVY has developed a brand new kind of coverall with built-in water wings to protect submarine personnel should they be swept overboard into churning seas.

The coveralls will be particularly useful on subs equipped with snorkel tubes. Because of their streamlined design, surfaced snorkel-type subs do not offer their crews as much protection on deck as older types do.

ASTRONOMY

Universe Found Heavier

► THE WEIGHT of the universe has been underestimated. It weighs almost ten times as much as previously believed, according to estimates just reported by Dr. Thornton Page of the Operations Research Office of Johns Hopkins University, Chevy Chase, Md.

The average galaxy of stars is about as massive as 80 trillion suns, Dr. Page figures. His measurements were made with the 82-inch reflecting telescope of McDonald Observatory in Texas while on the staff of the University of Chicago.

The universe is very widely spread, however. On the average, there is only about one pound of the cosmic material of which stars are made in the space occupied by 40,000 earths, the astronomer calculates.

Double galaxies provide the best means that are presently available for determining

the mean density of the universe, Dr. Page believes.

Just as the masses of double stars can be approximated, so can the average mass of double systems of spiral nebulae be estimated by measuring their distance apart and the speed with which these huge aggregations of stars swing around each other.

There are many heavyweight and many lightweight galaxies in the universe, but few with masses in between, if the 40 pairs of galaxies studied are typical of double systems throughout the universe. The lightweight systems weigh about five trillion times as much as our sun, the equally numerous heavy ones average 150 trillion times the sun's mass, Dr. Page reports in the latest issue of the *Astrophysical Journal* (July).

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MEDICINE

Water-Logging Stopped

► WHEN HUMAN bodies become waterlogged because of congestive heart failure, cirrhosis of the liver or high blood pressure without known cause, synthetic resins can relieve the condition.

The resins are chemically related to plexiglass and similar to those used in water softeners. The patient swallows them in the form of a finely ground powder stirred in water or fruit juice.

Successful use of this treatment was reported by Dr. B. L. Martz of the Indianapolis General Hospital, Indianapolis, at the meeting of the American Medical Association in Denver.

The water-logged condition in heart and liver patients, he explained, comes because the body cannot eliminate sodium, a mineral in table salt and many foods. Rigidly low sodium, or salt, diets plus injections three or more times a week of mercurial compounds have been necessary to remove the excess water and sodium from the bodies of such patients.

The new resins eliminate or greatly decrease the need for the mercurial injections and allow the patient a more palatable diet.

Dr. Martz reported good results in the resin treatment of 50 patients with congestive heart failure, and in all but one of 18 patients with ascites, or fluid accumulation, due to cirrhosis of the liver.

Of 18 patients with high blood pressure, eight were brought to normal by restriction of sodium and the use of resin. In five more cases the blood pressure was reduced significantly. The other five failed to respond.

Because of the relatively large bulk of material that had to be swallowed in this form of treatment, there were some cases

of mild or marked gastrointestinal disturbances. Side-effects prevented continuance of treatment in eight.

Drs. K. G. Kohlstaedt, O. M. Helmer and R. S. Griffith, all of Indianapolis, cooperated with Dr. Martz in the study.

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TECHNOLOGY

Radioactive Tracers Mark Pipe-Line Oil

► OIL COMPANIES now are using radioactive materials to label different kinds of oil routed through the same pipe-line to various points along the pipe-line's length.

Dr. Paul C. Aebersold of the Atomic Energy Commission reported to the American Management Association that oil wastes can be cut by the new technique.

Since a pipe-line may be used to carry many different kinds of oil, it is difficult to get "clean separation" at the point where one batch of oil ends and a different grade begins. By putting radioactive materials into the line just before changing the grade, engineers have provided themselves with an effective label.

Geiger counters trace the radioactive material as it moves through the line. When it gets to the terminal scheduled to receive the grade of oil following it, terminal operators detect the radiation and draw off only the oil they are supposed to receive.

One company already is using the method to label oil flowing through its 550-mile pipe-line from Salt Lake City to Pasco, Wash.

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EXPOSURE SUIT—For submariners swept overboard at sea, the Navy has developed a new kind of coverall to protect the sailors from exposure.

Made of neoprene-coated nylon, the coveralls have detachable boots and mittens. That permits small men with big feet to be fitted as easily as tall men with small feet. The mittens can be left off or worn, depending upon the work being done by the sailor.

Should he be carried overboard by a wave, the sailor can inflate his water wings by pulling a cord that releases carbon dioxide into the life vest. With boots and mittens on, the sailor can stay afloat in the ocean without getting wet.

The rubber boots, actually the forerunner of those now being worn by servicemen in Korea, have a steel ring imbedded in their tops. An expandable rubber cuff attached to the trouser leg of the coveralls stretches over the boot's ring, providing a watertight seal. The same arrangement is used to seal on the mittens.

About 500 test suits already have been tried out in the Atlantic and the Pacific. T. J. Seery, head of the clothing research development section of the Navy's Bureau of Supplies and Accounts, reported that the coveralls were received enthusiastically. Clothing specialists now are working on what they believe is the "final model." The coveralls soon should be standard equipment for all submariners, Mr. Seery suggested.

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DENTISTRY

Nation's Growing Sweet Tooth Menaces Teeth

► IF OUR national sweet tooth grows much bigger, we may not have any natural teeth left for enjoying sweets.

This dim outlook comes from the American Dental Association in Chicago. It is inspired by a report that the annual wholesale candy bill of the American people is about a billion dollars.

"Strangely enough, the nation's dental bill, last year, totaled much the same amount," comments the editor of the *Journal of the American Dental Association* (Dec.).

Last year retail candy sales are reported to have reached a record breaking consumption per capita of about \$10.72, or 64% more than the \$6.55 spent per capita for dental care during the same period. Maybe, says the dental editor, the difference between the annual candy expenditure and that for dental care accounts for the fact that "cavities occur in children's teeth six times as rapidly as they are repaired."

Science News Letter, December 13, 1952

ENTOMOLOGY

Foreign Leafhopper Gets North American Foothold

► AN UNDESIRABLE alien, the European leafhopper, has established itself in North America, Dr. Herbert H. Ross, entomologist of the Illinois Natural History Survey, Urbana, has discovered.

Dr. Ross found eight male and five female European leafhoppers in an insect collection from British Columbia. Although common in Europe, where it feeds on a variety of shrubs and trees, this leafhopper, *Erythroneura flammigera*, has never before been reported in North America.

A near relation, the North American leafhopper, spreads a deadly elm disease, phloem necrosis. Dr. Ross said he expects the newcomer may spread through much of Canada and northern United States.

Science News Letter, December 13, 1952

INVENTION

Radio-Set Altimeter Aids Plane Landings

► ACCURATE READINGS of an airplane's altitude over the ground level of an airport can be automatically set into the plane's altimeter through use of an invention now patented.

Most altitude indicators in planes work on the principle of the barometer and indicate height from sea level, not taking into account the rise of the ground underneath. However, if the height of the ground is accurately known, it can be—and often is—put into the altimeter by hand. The control tower tells the pilot the airport's altitude by radio.

However, it is pointed out, this allows for mistakes. The inventor, John H. Andresen, Jr., Port Washington, N. Y., has invented a method of automatically sending the atmospheric pressure at airport ground level directly to the barometric altimeter in the plane. The information is sent over a fixed FM frequency. Variations in the atmospheric pressure are sent by automatically varying the audio frequency being broadcast. A servometer in the altimeter picks up this information and translates it into an accurate reading for the pilot. The signal is automatically cut off as the pilot leaves the airport.

Mr. Andresen assigned his patent, number 2,618,976, to the Kollsman Instrument Corp., Elmhurst, N. Y.

Science News Letter, December 13, 1952

PLANT PATHOLOGY

Look for Key to Virus Puzzle in Tobacco Leaves

► WHY TOBACCO mosaic viruses act one way in a small, tender leaf and differently in a larger, older leaf is being investigated for clues concerning how viruses work by Drs. Morris Cohen, Albert Siegel and Samuel G. Wildman.

Their study has revealed that if a small, young tobacco leaf is inoculated with two strains of virus, the strains become competitors. In the ensuing "battle," one strain tends to propagate much more rapidly and to predominate throughout the plant.

In a mature tobacco leaf, something else happens. When the two strains are introduced into the large leaf, they coexist peacefully. Both propagate equally well.

Why this should be so may furnish much insight into the virus problem, the University of California at Los Angeles researchers say.

Science News Letter, December 13, 1952

RADIOLOGY

Double X-Rays Diagnose Asthma

► A NEW method of X-ray examination in bronchial asthma is announced by six Spanish physicians in the *Journal of the American Medical Association* (Nov. 29).

The method, briefly, consists of taking two X-ray pictures, one when the patient is taking a deep breath as possible and the other when he has forced all the breath out of his lungs. By putting one picture on top of the other, the doctors can get a record of the expansion of the diaphragm, the ribs and the collar bones.

The "pump-like" and other kinds of breathing of asthma patients shows clearly and quickly, enabling the doctor to adapt treatment to the patient's particular condition.

Physicians reporting the new method are Drs. C. Jimenez Diaz, C. Albert, V. L. Barrantes, F. Lahoz, L. Salgado and C. Lahoz, all of the University of Madrid, Spain.

Science News Letter, December 13, 1952

IN SCIENCE

PHYSICS

Atomic Particles Born of Few Billion Electron Volts

► THE MYSTERY of the nature and origin of some of the fundamental particles of the universe, called mesons, will be pursued more hopefully as the result of discovery by a group of Naval Research Laboratory physicists in Washington that heavy mesons can originate in atomic collisions of relatively low energies.

The energies are low for those scientists who study cosmic rays in which the birth of these mesons is detected. Heavy mesons of 1,270 and 500 times the mass of the electron have been found in interactions of only a few billions of electron-volt energy. Heretofore, mesons have been associated with happenings in which many more "bev's," as the scientists call them, are involved.

This new research, reported by Drs. D. T. King, Nathan Seeman and Maurice M. Shapiro to the American Physical Society, raises the hope that the particles can be created in future atomic accelerators and studied more closely.

Such research is aimed at understanding the composition of the atomic nucleus, or heart, which contains the energy of the universe.

Science News Letter, December 13, 1952

GERONTOLOGY

Operations Are Safe For 80-Year Oldsters

► "THE ELDERLY patient, 80 years or over, need not be permitted to die because he is thought too old to withstand surgery," Dr. Sidney E. Ziffren of the State University of Iowa College of Medicine, Iowa City, declared at the meeting of the American Medical Association in Denver.

"A 10-year study at the State University of Iowa Hospitals in Iowa City proves that the oldster, when properly prepared and carefully managed, can withstand almost any surgical procedure. These operations add several years of active life," he said.

Life-span studies show that 80-year-olds have almost six years life expectancy, while those at 90 have more than three years, Dr. Ziffren pointed out.

Of 429 very old patients who underwent 477 operations during the 10-year period, only 65 died. Some of these deaths could not have been prevented even by operations at a younger age, Dr. Ziffren said.

The most common causes of death in the group studied were pneumonia, blood clot in the lung, heart failure and peritonitis, or inflammation of the membrane lining the abdominal wall.

Science News Letter, December 13, 1952

SCIENCE FIELDS

BIOCHEMISTRY

Pituitary Hormone Is Made Radioactive

► ONE OF the many hormones produced by the pituitary, the so-called master gland of the body, has now been tagged with a radioactive isotope chemical.

The isotope is radioactive sulfur. The hormone tagged with it is the one that stimulates the thyroid gland in the neck. Now that the hormone can be labeled and traced through the body, scientists hope to learn much more of how it acts.

First to succeed in thus labeling the thyrotropic hormone are Drs. Martin Sonenberg, William L. Money and Rulon W. Rawson of Sloan-Kettering Institute, Memorial Center, and Dr. Albert S. Keston of New York University-Bellevue Medical Center, New York.

Science News Letter, December 13, 1952

METEOROLOGY

Cold Christmas Is Forecast

► A COLD Christmas is predicted for most of the nation. "Below seasonal normals" is what the Extended Forecast Section of the Weather Bureau says most of the country may expect until the end of the year. Exceptions are the northern tier of states extending eastward from the Dakotas, and Florida.

These areas are predicted to have usual or slightly above usual temperatures.

The southern half of the nation can expect more rain and snow than usual in December. The snow line will probably extend from the Texas Panhandle to North Carolina. The northern half of the country will receive about normal amounts of rain and snow.

Science News Letter, December 13, 1952

SURGERY

Surgery Removes Hip Joint, Patients Walk

► THE ENTIRE hip joint, the major part of the pelvis and the entire tie arch of the pelvis can now be removed surgically. Four cases in which such massive defects were created to cure other conditions are reported by Dr. Paul R. Lipscomb of the Mayo Clinic, Rochester, Minn. They are the first four such operations on record.

In two cases, the operations were done for osteomyelitis which had been present for 15 and 11 years respectively. In both cases, the disease was cured and the patients were able to walk, run and jump normally, and to work, in one case as repair-

man for a city water department and in the other as a farmer.

The other two cases were operated on because of tumors. The tumors have not yet recurred 54 and 17 months, respectively, after the operation. Both these patients are able to walk, although one still uses crutches but with more and more weight on the gradually strengthening leg.

The patients who had the entire tie arch of the pelvis removed have not suffered any low back pain. From this experience Dr. Lipscomb says:

"The probabilities are that sacroiliac sprain or strain as a cause of low back pain is extremely rare and perhaps nonexistent."

Removing the major portion of the pelvis with its muscles and the entire hip joint may in some cases, Dr. Lipscomb says, be preferable to amputation of the entire leg from the abdomen and pelvis.

Science News Letter, December 13, 1952

PHYSICS

Mattress Measures Relaxation in Sleep

► TO MEASURE comfort and quality of sleep, science has now devised a standard "universal test mattress" that can detect and record the distribution of the weight of a contented sleeper.

As explained to the American Physical Society meeting in St. Louis, the new experimental mattress has many individual rubber bellows instead of springs. When each bellows is compressed, the increase in pressure is measured by a gauge which records the change in volume.

Norman L. Taylor and T. Smith Taylor of the U. S. Testing Company, Hoboken, N. J., in their experiments vary the softness and hardness of each section of the mattress to give the experimental sleeper maximum relaxation.

Science News Letter, December 13, 1952

VITAL STATISTICS

More Men TB Victims Now, Reversing Past

► A REVERSAL of sexes affected by tuberculosis has taken place. The white plague now is claiming more new victims among men than women, whereas in the past tuberculosis particularly affected women.

This finding is reported by Drs. Robert J. Anderson and Herbert I. Sauer of the U. S. Public Health Service.

Their study of TB cases reported in the United States in 1949-1951 also shows that tuberculosis is hitting the older age groups now, instead of the younger ages as formerly.

For 1951 there were approximately 118,500 newly reported cases of the disease, compared to 136,000 in 1947 and 1948. Although new cases dropped only 13% from 1947 to 1951, deaths from tuberculosis fell by about 35%.

Science News Letter, December 13, 1952

VETERINARY MEDICINE

Foot and Mouth Disease Stamped Out in Canada

► FOOT AND MOUTH disease that has killed Canadian cattle since February seems to have been stamped out.

The U. S. Department of Agriculture has announced that, barring new outbreaks, Canadian beef will be allowed entry into the United States after March 1, 1953.

Vigorous measures of isolation and slaughter of infected cattle kept the highly infectious disease from spreading through Canada and into the United States. A rigid quarantine against Canadian livestock protected U.S. cattle, although at one time an outbreak occurred only 50 miles from the border.

This highly fatal disease is endemic and always present in most of the world. The United States, Australia, New Zealand, Central America and the West Indies are the only large areas free from foot and mouth disease.

It is especially troublesome in Europe, where an estimated loss of \$600,000,000 in livestock has been caused by foot and mouth disease during the last 18 months.

An outbreak of foot and mouth disease in Mexico in 1946 caused a quarantine of Mexican beef to the United States that only ended this September, when the disease was officially declared eradicated. The United States spent over \$100,000,000 cooperatively with Mexico to stamp out the disease there.

Science News Letter, December 13, 1952

MEDICINE

Better Doctors Expected From School Experiments

► BETTER DOCTORS are expected from experiments in medical education now under way in a number of medical schools. The experiments are designed to find ways of getting a better balance between specialized and general medicine, and to train young doctors to understand their patients as well as to know the latest scientific methods of diagnosing and treating disease.

To aid in these studies, the Commonwealth Fund appropriated almost two million dollars in the last fiscal year. About \$400,000 was appropriated for medical research.

Grants planned to improve further the training of doctors are described in the annual report of the Fund. Among them is a new grant to the University of Tennessee to support a family general practice clinic, in which students already partly trained by specialists have an opportunity to work under the supervision of general physicians and under conditions like those prevailing in private practice in that state; and also a grant to a special clinic at the Peter Bent Brigham Hospital, Boston, to strengthen the psychiatric part of comprehensive care for women with gynecological difficulties.

Science News Letter, December 13, 1952

ANTHROPOLOGY

Christmas Rooted in Past

Christmas trees, mistletoe (with kisses), Yule logs, even Santa himself, all find their roots in the pre-Christian north-land. Over 30,000,000 trees will be used in U. S. this Christmas.

By HORACE LOFTIN

► CHRISTMAS — the birthday of the Christ-child—has come to be the most universal and joyous of all Christian festivals. The first people to practice Christmas, finding no guide from the Gospels to the festival, turned to their old pre-Christian holidays for a model. For this reason, many modern Christmas customs are a mixture of pagan and Christian tradition.

Much of our own English-American Christmas has its roots deep in the pre-Christian era of the dark, barbarous North—the land of Thor and Woden. The Christmas tree, holly, mistletoe, the Yule log, even Santa Claus himself, can be traced back to traditions handed down from the early North Europeans.

Just when and where trees were first used in the Christmas celebrations may never be known, but trees were a vital part of nearly all of the pagan Northland's festivals. The May-pole, used to welcome the return of Spring, was originally a tree and was decorated much like the Christmas tree. Trees were always found in the rude northman's hut at New Year's, to drive away evil and bring good luck.

The early Church frowned upon the pagan introduction of trees into Christmas; but the joyful feeling of the common people at this great anniversary, the birth of their Lord, prevailed. As late as 1740, however, a German pastor described the Christmas tree as a non-Christian innovation.

First Used Here by Germans

General acceptance of the Christmas tree as a necessary part of Christmas did not occur until the 18th century in Germany. It spread to Scandinavia early in the 19th century. France and England adopted the Christmas tree after the middle of the 19th century. Tradition says that Christmas trees were first used in America by German soldiers hired by England to fight in the Revolutionary War.

In modern-day America, well over 30,000,000 Christmas trees are grown commercially each year, not to mention the thousands taken from the woods by individuals. Spruces, firs, Douglas fir, pines, red cedars and arbor vitae are the favorites of the American public.

Spruces lead in popularity in the United States. There are many kinds of spruces, but you can always tell the family by their short, sharp-pointed, prickly needles. Spruce

cones are small and hang downward from the branches.

Firs are perhaps prettier than spruces, but they are more expensive. The typical Christmas tree of Europe, firs have soft, blunt-pointed needles that are slightly curved, distinguishing them from spruces. Fir cones sit upright on the branches, like short, fat candles.

Douglas firs are not what their name implies, but belong somewhere between firs and spruces on the family tree. It is hard to list needle characteristics that can be used to identify them, but you can always tell Douglas firs by their cones. Between each of the scales of the cones there is a little three-pronged projection which is found on neither firs nor spruces.

Pines are easily distinguished from the above trees because pine needles always come in bundles of two or more, joined at the base by a thin paper-like tissue. Spruce, fir and Douglas fir needles are always attached singly to the branches.

White pines always have five needles in a

bundle. The large class of yellow pines have varying numbers of needles in each bundle, but two per bundle is usual.

All of the trees described so far have cones. The remaining two most popular Christmas trees in the United States, red cedar and arbor vitae, have berries instead of cones. Red cedar makes a handsome Christmas tree, but its small, delicate needles fall off too easily for it to be very welcome in the house. Arbor vitae, with its fern-like branches and small, scaly leaves, is known more as an ornamental than as a Christmas tree, although its popularity for the latter use is growing.

Other Pre-Christian Customs

Mistletoe, holly, ivy and other evergreens came into the Christmas tradition by way of pre-Christian customs, too. The delightful tradition of allowing license to kiss the unwary—or very wary—maid caught beneath the mistletoe has been traced back to very ancient fertility festivals. In the north of England where mistletoe was scarce, a tree limb hung with fruits and nuts was used in its stead.

While holly is in real danger of being seriously depleted by Christmas users, there seems to be no effective way to reduce the amount of mistletoe in the wilds. Mistletoe



SPRUCE IN SNOW—When the world was wrapped in snow and the winter sun hung low in the horizon, the rude northmen of pre-Christian Europe looked to evergreens as a promise of rebirth of nature at spring. The Christmas tree is now used to celebrate the coming of the Christ-child, symbol of the rebirth of the human spirit.

is a plant parasite that lives from the substance of host trees, doing them great damage and eventually causing their deaths. In many regions, especially the South, it is plentiful; but as it grows in the tree tops, it is extremely hard to harvest. About the most effective way to gather mistletoe is to shoot it down with buckshot. This means, of course, that its price remains very high, and that not enough is harvested to deplete the supply.

Holly, on the other hand, is a harmless, beautiful tree that is very vulnerable to the depredations of hunters. Holly trees are either male or female, and only the female trees bear berries. Many once-large stands of holly have been stripped of all their bright berry-bearing trees, leaving only the male trees with no chance to reproduce themselves whatever. These stands are doomed. Holly is being raised commercially in great quantities now. You will do a lot to save our disappearing wild holly if you buy only the commercial variety this Christmas.

The old English custom of burning the Yule log at Christmas is another hold-over from pre-Christian days. Throughout North Europe a mid-winter festival, the Yule feast, was celebrated to mark when the low winter sun began to rise once more in the horizon. This Yule feast was one of the most important of the northland, and the Yule log comes directly from it, even carrying its name.

Late December Festivals

In the Near East, Greece and Rome, and other Mediterranean countries, the pre-Christian people celebrated similar mid-winter festivals, too. The Babylonian Zagmuk and the Greco-Roman Saturnalia were great festivals that fell near the end of December.

For this reason, many scholars think that early Christians, bent on converting the pagans, chose Dec. 25 as Christ's birth date to wean them from their old celebrations. Who can say for certain when Christ was born? There is no hint in either the Gospels or early tradition.

It is not unlikely that this was the case, as modern missionaries often supplant heathen traditions with Christian practices in their

work to win converts. The Christianizing of the Indians by the Spanish padres offers a good example of how this was done on a large scale. Many of the "saint's day" celebrations in Indian villages today really mark the dates of traditional Maya, Aztec or Inca fiestas.

Old Saint Nick has a touch of the pagan in his family tree, too. The North god, Woden, or Odin, dressed in a flapping hat and a fluttering mantle, and traveling constantly on a white horse to bestow gifts and punishments where they are called for, is seen reflected in the European idea of Saint Nicholas. On the continent, St. Nick wears a flapping hat, a fluttering mantle, and is mounted on his faithful white horse.

Hard Working Saint

The historical Saint Nicholas, by the way, lived in Asia Minor during the third century. In legend he is one of the hardest-working saints there can be. Besides his well-known Christmas duties, he is the patron of travelers, seamen and ships, and even thieves and pirates claim his protection. He watches over the small and humble, and keeps special care over unmarried girls.

Saint Nicholas was a traveler, and where he went he left small gifts for worthy folks. In the North, this tradition became blended into that of Woden; and soon there emerged old Santeklas who brings gifts to good children and switches for the bad.

The northern tradition of Christmas, then, represents the folk-way of the rude but joyous northmen before the tender story of the birth of their Christ-child. The merriment of the northern Christmas is their humble offering to the new-born King.

Science News Letter, December 13, 1952

MEDICINE

Heart Trouble May Be Disguised as a Cold

► ONE KIND of heart trouble may appear disguised as a seemingly unimportant cold, sore throat, or pneumonia or other infection. Drs. Mischa J. Lustok, Jules Chase and Joseph M. Lubitz of Marquette University School of Medicine, Milwaukee, warned at the meeting of the American Medical Association in Denver.

The heart trouble is called myocarditis, meaning inflammation of the heart muscle.

The Milwaukee doctors reported 45 such cases in a group of young men and women. Because these patients seemed sicker than they should with just a cold or sore throat, or did not get well as quickly as expected, or had unexplained heart findings, myocarditis was suspected.

When recognized early, much of the serious heart damage in such cases can be prevented, Dr. Lustok said.

Considering the great number of people who suffer from colds, sore throats and other infections, this complication is quite rare, Dr. Lustok pointed out.

Science News Letter, December 13, 1952

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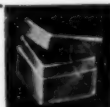
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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. books in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N. Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALL-IN-ONE OVEN MEALS—Ruth Bean—*Barrows*, 223 p., \$2.95. A section of this book is made up of "under the broiler" recipes that are the quickest of all to prepare.

COINOMETRY: An Instructive Historical Introduction to Coins and Currency for the Young Collector—Robert V. Masters and Fred Reinfeld—*Sterling*, 93 p., illus., \$3.50. The authors have included in their guide a number of interesting stories about coins and coin collecting.

EVOLUTION AND HUMAN DESTINY—Fred Kohler—*Philosophical Library*, 120 p., \$2.75. The author warns the reader against the attempt to draw socio-political conclusions from the physical and biological data which he has presented, as there is a tendency for such conclusions to become dogma.

FIRST BOOK OF BRIDGE—Alfred Sheinwold—*Sterling*, 153 p., illus., \$2.00. This book, written by the playing partner of Oswald Jacoby, will help teen-agers in developing their game. Every system of bidding is discussed and important points are illustrated by the playing of a complete hand.

THE HOME FRUIT GARDEN IN THE NORTH-EASTERN AND NORTH CENTRAL STATES—Govt. Printing Office, USDA Leaflet No. 227, 8 p., paper, 5 cents. Information on the varieties of

fruit that can be grown in these states and hints for planting and care.

KODAK DATA BOOK ON SLIDES—*Eastman Kodak Company*, 4th ed., 47 p., illus., paper, 50 cents. A reference manual, giving step-by-step procedures, for those interested in making their own slides.

THE MAN'S COOKBOOK—Arthur H. Deute—*Barrows*, 254 p., \$2.95. A compilation of the author's recipes which he collected as a hobby and later published in newspaper articles. Originally published as 200 DISHES FOR MEN TO COOK.

THE MESQUITE PROBLEM ON SOUTHERN ARIZONA RANGES—Kenneth W. Parker and S. Clark Martin—*Govt. Printing Office*, USDA Circular No. 908, 70 p., illus., paper, 25 cents. Results of applying of 2,4-D and 2,4,5-T resulted principally in defoliation. They are not recommended for control on the arid and semi-arid ranges of Arizona.

THE NILE: A General Account of the River and the Utilization of Its Waters—H. E. Hurst—*Constable* (Macmillan), 326 p., illus., \$6.00. This is an account of one of the world's greatest rivers, which has held the interest of geographers, historians, archaeologists and engineers. Unlike other great tropical rivers, the Nile flows from south to north.

101 BEST GAMES FOR GIRLS 6 TO 12—Lillian and Godfrey Frankel—*Sterling*, 128 p., illus., \$2.00. Simple games that can be played with little or no assistance from adults, with instructions written so that they can be read by children in this age group.

PROJECT MOUSE: Rx Mouse and X Mouse—Clarence C. Little, Ed.—*N. H. Chapter, Jackson Laboratory Association*, 83 p., illus., paper, \$1.67. This project was planned especially for science clubs and high school science classes to aid in providing scientists with the animal material they need for the battle against cancer.

RECORDINGS FOR TEACHING LITERATURE AND LANGUAGE IN THE HIGH SCHOOL—Arno Jewett—*Govt. Printing Office*, Office of Education Bulletin 1952, No. 19, 71 p., paper, 25 cents. Descriptions of ways in which commercial recordings are being used by teachers. About 500 titles are included in the bibliography of records.

ROCKETS BEYOND THE EARTH—Martin Caidin—*McBride*, 304 p., illus., \$4.50. After a discussion of developments in rockets during and after World War II, the remainder of the book is concerned with the non-technical aspects of space flight.

SOVIET CIVILIZATION—Corliss Lamont—*Philosophical Library*, 433 p., \$5.00. In the course of two extended trips to Soviet Russia and 20 years of study, the author found much to admire as well as to criticize. This book, which will be controversial, is stated to be an effort "to help stem the tide of misunderstanding between the United States and Soviet Russia, and thereby to make some contribution to the enduring peace for which our two peoples and the whole world so yearn."

SOVIET SCIENCE: A Symposium Presented on December 27, 1951, at the Philadelphia Meeting of the American Association for the Advancement of Science—Ruth C. Christman, Ed.—*American Association for the Advancement of Science*, 108 p., \$1.25. Though motivated by the desire to report the factual status of Soviet science, the writers have also taken up the effect of political intervention on science.

THE STORY OF MICROBES—Albert Schatz and Sarah R. Riedman—*Harper*, 172 p., illus., \$2.75. A children's book explaining the discovery and utilization of microbes. Included are simple experiments that will make the text more meaningful.

UNESCO FACTS: Six Years of Work—UNESCO Relations Staff, 18 p., paper, free upon request to publisher, Dept. of State, Washington 25, D. C. This report, the first in a new series, is a review of UNESCO's activities since its organization in 1946. Emphasis is on the developments during 1951.

WINCHESTER: The Gun That Won the West—Harold F. Williamson—*Combat Forces Press*, 494 p., illus., \$10.00. The financial success of the Winchester Repeating Arms Company was based on nonmilitary sales. An historical record of this company's growth since its founding in the 1850's.

Science News Letter, December 13, 1952

VETERINARY MEDICINE

Animals Have More Allergies Than Man

► **ALLERGIES ARE** more common in animals than in human beings, the American Veterinary Medical Association reports.

A dog got hives when the owner used a face powder to which the animal was allergic, the association reported. Other examples given are:

A herd of purebred cattle got hay fever and recovered when moved to another pasture.

A horse got skin trouble from allergy to substances in saddle soap and leather conditioner.

Dogs, the association added, get eczema from food allergies, and hay fever and rhinitis (running nose) from ragweed pollen.

Science News Letter, December 13, 1952

ENTOMOLOGY

Insecticide Kills Mosquito Larvae

► **AN INSECTICIDE** that kills mosquito larvae unharmed by DDT has proved effective in tests by the U.S. Department of Agriculture.

One ounce of the insecticide, EPN, sprayed over an acre of flooded California pasture, caused almost complete extermination of mosquito larvae, while up to one pound of DDT-type insecticides, chlorinated hydrocarbons, failed to control them.

EPN, a phosphate compound, will not be released for general use yet, because it is highly toxic to man and warm-blooded animals when improperly used.

Science News Letter, December 13, 1952

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MEDICINE

Cancer Runs in Families

► CERTAIN TYPES of cancer show signs of heredity, or of running in a family, a report from the American Cancer Society states. Breast cancer, for example, tends to be found more often in the female relatives of women who have breast cancer than it does in the general population.

Knowledge of this can be helpful in preventing cancer in the other members of the family of a cancer patient, or in having the cancer diagnosed at the earliest time once it has developed.

If one member of a family has had cancer of the stomach, the patient with vague symptoms of indigestion and his physician should be more alert to the possibility of cancer. If one member of the family has had cancer of the rectum, the symptoms of chronic constipation or bleeding from the rectum should send the next member of the family at once for a medical examination.

Almost everyone who has a relative with cancer will at times wonder whether it will be "me too?" Some will wisely consider

the possibility and take the common sense precaution of seeing their doctor regularly for complete examination, and seeing him in between examinations if any symptom develops or if they are just vaguely worried about the possibility. Others, unfortunately, will take a foolish ostrich attitude and refuse even to think of the possibility.

It is understandable that a person who saw a parent or grandparent die of cancer may feel both frightened and hopeless about cancer in himself or herself. But such a person should remember that many advances have been made in cancer fighting. Many, who a generation ago would have died of cancer, today are being saved by early, adequate treatment.

Methods of treatment and of diagnosis have been improved. Lives that cannot be saved are being lengthened and made more comfortable. Knowing this should give courage to fight cancer, not shrink from the thought.

Science News Letter, December 13, 1952

MEDICINE

Plastic Warms Cold Feet

► COLD FEET can be warmed by more than eight degrees Fahrenheit, and blood flow to the feet can be increased by a plastic sleeve worn as a boot.

The results that can be obtained with this simple device are reported by Drs. Kenneth R. Woolling, Edgar V. Allen, Grace M. Roth and Khalil G. Wakim of the Mayo Clinic and Foundation, Rochester, Minn.

This new kind of bedsock consists of: 1. A sterilizable, transparent, plastic inner sleeve with thermoplastic sealed seams; 2. An outer sleeve consisting of two layers of opaque plastic sheeting separated by a space of one inch that contains spun glass for insulation. The entire thing weighs a little over one pound.

The inner sleeve is slipped over the foot like a stocking and then the outer sleeve is applied over the inner. Both sleeves cover the foot and leg as a double layer, high boot coming up to about the middle of the thigh.

The boot achieves its effect by conserving heat in the foot and lower leg through insulation. As the temperature increases, the blood vessels are dilated and more blood flows into the lower leg and foot. It should prove useful, the Mayo scientists suggest, in various diseases of poor circulation, and after operations to prevent thrombosis, or clot, in veins.

It is simple and avoids the danger of burning that goes with devices which warm and increase blood flow by applying heat instead of conserving it.

The person with poor circulation and cold feet, or his doctor, wanting to try the device

can get it under the tradename, Autotherm, from the Micro Institute, Division of Image Transfer, Randolph, Mass. Use of the device to replace the conventional hot pack poultice was reported earlier by Drs. C. L. Claff and Chilton Crane of Boston. Dr. Woolling and colleagues reported their trial of it at a staff meeting of the Mayo Clinic.

Science News Letter, December 13, 1952

OPHTHALMOLOGY

Snow Blindness From Reflected Rays

► FRESHLY FALLEN snow shining in the sunlight is a dazzling sight that may make you close your eyes for a minute, squint or reach for last summer's dark glasses.

If you are a skier or mountaineer or if for any reason you are going to be exposed to this dazzle for a long time, you should wear dark glasses to protect your eyes from snow blindness.

This condition, which is sometimes called glacial sunstroke, snow ophthalmia or ophthalmia nivalis, is not caused by the snow, Dr. A. Link Koven of the University of Pennsylvania Graduate Hospital, Philadelphia, explains in a report issued by the U. S. Public Health Service.

Snow blindness is caused, he says, by light rays that may be reflected from snow. It usually occurs at altitudes over 1,000 feet and may occur in overcast weather as well as in bright sunshine.

The patient usually experiences signs of

irritation, and feels as if he has sand under his eyelids, after approximately 10 hours of exposure to the sun. The conjunctiva, which lines the lids and covers the eyeballs, becomes red and swollen. Pains in forehead and photophobia occur. In severe cases, one can see erosions on the cornea. The patient is prevented from opening his eyes because of the violent spasms of the eyelids.

These are the cases, Dr. Koven says, which are referred to inaccurately as "snow blindness," since the patient is prevented from seeing because of the intense spasm and swelling of the lids. When the acute symptoms subside, the patient usually complains of a dazzled condition, later on a sense of failure of the illumination of objects, and also of seeing black or red spots, or even a large central area of darkness. In a few days complete recovery occurs.

Science News Letter, December 13, 1952

FLATLAND

IS BACK IN PRINT

WHAT IS FLATLAND? It is like nothing you have ever read before. It is not space opera, but it deals with space. It is not an "action" story, but it describes adventures—intellectual adventures in the realm of pure mathematics and logic. It IS fiction, yet it may make some truths clearer to you than many a scientific text. **FLATLAND** is a brilliant and unorthodox work of art. So absorbingly out-of-the-ordinary that connoisseurs have exhausted five previous high-priced editions (including numerous printings).

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TECHNOLOGY

Radiophone Fights Snow

► LONG DISTANCE telephone operators will be able to blow horns of unattended snowplows and leave light messages for snowplow and highway maintenance truck drivers this winter with institution of two-way radiophone service for almost all winter highway maintenance equipment in the province of Ontario.

Two-way radio telephone service is being installed on 108 snowplows and a larger number of maintenance trucks this winter by the Ontario Department of Highways to speed up clearance of over 10,000 miles of road during heavy snowstorms.

Since snowplow and truck drivers of maintenance trucks sometimes operate alone, it will be possible under the new system to summon them to their vehicle when they are not in the cab of the car. When a driver does not answer the summons of a long distance telephone operator at once, she can automatically start the horn in the cab of the snowplow or truck to get his attention.

If the driver is too far away from his vehicle to hear the horn and does not come to answer the radiophone, then the operator automatically switches on a light in the cab, which tells the driver to call the long distance operator when he gets back to the cab.

The radio telephone service has been used experimentally with winter highway maintenance equipment in Ontario the past few years in the area about Toronto. It is being expanded this year to cover most of southern and eastern Ontario, and will be further expanded in 1953.

The radio telephone will help speed up the massing of snow cleaning equipment during and after a heavy snowstorm, and will allow massing of sanding trucks on road sections where there is glare ice. It will help move equipment quickly from one division to another. It will also provide emergency communication to summon doctors and ambulances to accidents.

Science News Letter, December 13, 1952

INVENTION

Sharper TV Pictures

► DR. ERNEST O. LAWRENCE, Nobel prize winner, has received a patent on an invention which promises to produce sharper television pictures.

Dr. Lawrence is director of the radiation laboratory at the University of California, Berkeley.

In his patent, number 2,619,612, Dr. Lawrence says that the present scanning method in television receivers tends to blur the line between light and dark areas in a picture. Dr. Lawrence would modify the deflection of the scanning beam in the direction in which the lines are scanned in proportion to the rate of change of illumination from point to point along the picture line. The deflection of the scanning beam would increase when the illumination is increasing and decrease when the illumination is decreasing.

With this method, Dr. Lawrence says, substantially full theoretical resolution of a television receiver may be sensibly obtained, and blurring of the edges of television images is reduced to a negligible minimum.

The patent is assigned to Chromatic Television Laboratories, Inc., San Francisco, Calif., to which Dr. Lawrence had previously assigned his method of color television.

Science News Letter, December 13, 1952

ANIMAL NUTRITION

Hogs Fed Terramycin Gain on Low Protein

► FARMERS MAY be feeding more protein to their hogs than is necessary. Experiments with terramycin, one of the Big Five so-called mold remedies, suggest this. The studies are reported by Prof. J. A. Hoefer, Prof. R. W. Luecke, F. Thorp, Jr., and R. L. Johnston of Michigan Agricultural Experiment Station, East Lansing.

Pigs on both high and low protein feeds gained at the same rate when both had been given terramycin.

A third of an ounce of terramycin to each ton of both high and low protein feeds produced fat pigs of substantially the same weight in 105 days. Pigs on the same diet except the terramycin ration took up to three weeks longer to reach slightly lower weights than the terramycin-fed pigs had reached.

Science News Letter, December 13, 1952

RADIO

Saturday, Dec. 20, 1952, 3:15-3:30 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

The Christmas tree will be discussed by the guest, A. M. Sowder, extension forester of the U. S. Department of Agriculture.

PLANT PATHOLOGY

Find Citrus Disease In Florida Orchards

► A VIRUS disease of citrus fruits that causes great damage in South America has become established in Florida orchards, reports the U. S. Department of Agriculture.

The virus disease, called tristeza, was identified from several Florida locations for the first time this year. Although the disease has caused great losses of citrus trees in South America, particularly Brazil, the Department does not expect tristeza seriously to impair Florida citrus production.

Tristeza has been known in California since 1940, under the name of "quick decline," the Agriculture Department said, but its rate of spread has been slow. The species of plant lice, aphids, that spreads the disease so fast in South America is absent in this country, acting as an automatic check.

Tristeza is a Spanish word meaning "sadness," an apt description of the disease. There are no clear-cut symptoms—the trees just seem to lose vigor, become unproductive and die.

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Questions

ANTHROPOLOGY—When was the Christmas tree first accepted as a necessary part of Christmas? p. 378.

• • •

ASTRONOMY—What are the best means for determining the weight of the universe? p. 375.

• • •

ENTOMOLOGY—What foreign pest has recently gained a foothold in North America? p. 376.

• • •

MEDICINE—How can heart trouble be disguised? p. 379.

• • •

OPHTHALMOLOGY—What causes snow blindness? p. 381.

• • •

PEDIATRICS—What four kinds of toys help all-round development of children? p. 372.

• • •

PUBLIC SAFETY—How can you figure the safe distance to the car ahead quickly? p. 373.

• • •

Photographs: Cover, Freeport Sulphur Co.; p. 371, Luria Engineering Co.; p. 373, Bell Telephone Laboratories; p. 375, U. S. Navy; p. 378, U. S. Forest Service; p. 384, Anacortes Veneer, Inc.

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METEOROLOGY

Machine Predicts Weather

Predicting large-scale mean flow of atmosphere over United States now possible and economically feasible, using mechanical or electromechanical business machines.

► A COMPLETELY automatic weather-forecasting machine," into which information about the current state of the weather will be fed directly, and "which inexorably and with great exactitude will calculate out the entire future course of the atmosphere," has been envisioned by a few meteorologists and mathematicians.

This machine of the future would utilize mathematical physics to make its calculations by a process of numerical forecasting. But already, according to Maj. Philip D. Thompson of the Massachusetts Institute of Technology, predicting the large-scale mean flow of the atmosphere over a few days time by machine methods is today economically feasible.

Right now, Maj. Thompson says, using only those mechanical or electromechanical business machines already in production, the process of predicting this large scale flow over an area the size of the United States could be made quite quickly.

"It would be neither necessary nor economical to install automatic forecasting equipment at each station," Maj. Thompson says. "It would be sufficient to maintain such facilities at only a few weather 'centrals.' Moreover, because it would require a highly trained team of specialists to operate and service the equipment, it would also be most economical to do so. The yearly cost of procuring, installing, continuously operating, and maintaining a facility of this type, amortized over the life of the equipment, would be comparable with the yearly salaries of ten professional forecasters."

Present day forecasting is of the type called "synoptic." The weatherman bases his prediction on his own skill and on his knowledge of the past behavior of a few variables in the weather, culled from observations at weather stations for a period of years.

This, according to Maj. Thompson, is an extension of the "statistical" method. In this, if temperature records over 50 years for a city show that the temperature has gone up one degree between Dec. 15 and Dec. 16 in 25 of those years, the statistical forecaster predicts that there is a 50% chance it will rise one degree this year.

Numerical forecasting, treating the atmosphere as a fluid, applies the laws of motions of fluids, expressed in mathematical formulas, to the problem of predicting how the fluid called air will move in the next few days. It applies those formulas to the information about the current weather. This involves millions of calculations. Now, with calculators which can do these "sums" in microseconds, this method becomes practicable.

Maj. Thompson did his work on numerical forecasting at the Air Force Cambridge Research Center, Cambridge, Mass.

Science News Letter, December 13, 1952

OCEANOGRAPHY

Ocean Level Rises Five Inches Since 1895

► THE GENERAL level of the world's oceans has risen five inches since 1895.

Dr. George F. Carter, chairman of the Johns Hopkins University geography department, Baltimore, reported to the Office of Naval Research in Washington that the rising sea is due largely to melting polar ice. The world now is in the tail end of a glacial period.

According to the best estimates, the coastlines of the world would be changed radically if all the polar ice melts. Sea level would be about 100 feet higher than at present.

"The east and Gulf coasts of America," he said, "would be altered beyond recognition. Long Island, most of New Jersey, the Delmarva Peninsula, most of Florida and great slices of the other coastal plain states would be under water. The Chesapeake Bay would cease to be a bay, while an inland sea would be created in the San Joaquin-Sacramento Valley; the Imperial Valley would become an extension of the Gulf of Lower California."

Although the sea level has risen in the last 12,000 to 25,000 years, it has not done so steadily. That makes "touchy business" of predicting when and if the total polar ice will melt. Since the sea level has changed irregularly, scientists have no basis upon which to make a forecast.

Although no immediate catastrophe is at

hand, future harbor facilities should be designed to accommodate a sea-level rise of about 24 inches within the next century.

Dr. Carter now is directing an ONR project aimed at learning more about the restless sea as it affects the Navy. Details of his work appear in *Research Reviews* (Nov.).

Science News Letter, December 13, 1952

Do You Know?

Aphids can infect healthy plants with beet-mosaic virus in only 10 to 15 seconds.

Helicopters can fly twice as fast, six times as far and can carry 15 times more payload than they could 10 years ago.

Small amounts of *terramycin* stimulate the growth of hatchery-bred rainbow trout.

Every gallon of present-day *gasoline* contains from 3,500 to 5,000 different chemical compounds made up of hydrogen and carbon.

With help from the World Health Organization, a 25-man team of Burmese health workers expects to give *anti-malaria protection* in 1953 to 110,000 persons living in an area of 2,000 square miles.

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⚙️ **SLAT CLEANER** for Venetian blinds grips both sides of the slat with sponge-like jaws, removing dirt and grime as the device is slid along the slat. Having a built-in cleaning-fluid reservoir, the device permits the housewife to clean her blinds without taking them down.

Science News Letter, December 13, 1952

⚙️ **FLANNEL SUITS** and slacks for men now are being made of a material that is 60% wool and 40% acrylic fiber. The fiber makes the suit hold its shape. Pants hold their creases even when soaking wet. Longer wearing, the lightweight material is warm and has a woolly feel.

Science News Letter, December 13, 1952

⚙️ **ROOF COATING**, resembling aluminum paint, reflects heat from the sun, prolonging the life of industrial roofs and lowering below-roof temperatures by 13 to 26 degrees. Brushed or sprayed on, a gallon of the coating covers about 300 square feet of roofing.

Science News Letter, December 13, 1952

⚙️ **FLEXIBLE HARDBOARD**, made in $\frac{1}{8}$ -, $\frac{3}{16}$ - and $\frac{1}{4}$ -inch thicknesses, sells competitively with standard hardboard, yet is so flexible that a small strip can be bent into a circle almost as tight as a hatband. Consisting of wood fibers that have been blown



into a thick, spongy mat and then pressed, the board, shown in the illustration, has high strength and dimensional stability.

Science News Letter, December 13, 1952

⚙️ **DRINKING FOUNT** for cattle maintains outdoor drinking water at the desired temperature even in sub-zero weather. Thermostatically controlled, the heated water is prevented from overflowing its

basin by a float valve. The "standard" fount works on regular 115-volt electric power, but a 230-volt model is available.

Science News Letter, December 13, 1952

⚙️ **PAINT MIXER** for stores produces the exact shade of paint or pigmented stain selected by the customer from nearly 150 samples. Using one or more of 12 concentrated colors, the machine automatically mixes them with a base paint, completing the job in about 90 seconds. Easy to operate, the machine works on standard electric current.

Science News Letter, December 13, 1952

⚙️ **"PLASTIC GLUE,"** complete with nylon brush applicator, joins plastic airplane models and mends broken plastic toys and dishes. Although many broken articles will stick together if held for 10 seconds after the glue is applied, best results are obtained if the glue is allowed to set an hour.

Science News Letter, December 13, 1952

⚙️ **FILM CLEANER**, because of its fast-drying properties, speeds up the cleaning of commercial movie film by 10% to 20% in machine operations. The cleaner effectively dissolves and washes away gums and oils that "dirty up" photographic film. It does not harm the emulsion of black-and-white or color film.

Science News Letter, December 13, 1952

• Nature Ramblings •

➤ **BIG THINGS** can evolve out of little ones, but not little things out of big ones.

The whole course of evolutionary history is littered with examples of developmental lines of animals and plants that started small, grew big, then huge, and then—died. Faced with changed and adverse conditions, they apparently could not contract the scale of their operations to weather the storm. They could only go into involuntary bankruptcy and pass out of the picture.

It was so with the dinosaurs. The earliest reptiles, in the age that succeeded the lush days of the coal era, were moderate-sized beasts. The biggest of them did not outrank modern crocodiles or the giant tortoises of the Galapagos. In succeeding geologic periods, one reptilian line, the dinosaurs, began to take on size; first as big as a horse, finally as big as a house.

Then came one of the world's periods of major geologic change—a revolution—and down went the dinosaurs. The reptiles that survived and now possess their modest share of the earth were the less ambitious, less

Meek Inherit the Earth



grandiose orders—lizards, tortoises and turtles, crocodilians, and later, the snakes.

The same is true of the giant plants that lived in the coal age. They were, some of them, relatives of the common horsetail rushes that now grow along railway embankments and in moist sandy soil. They aspired to great heights, developed into things as big as the giant cacti of our Southwest.

But when geologic hard times came they

couldn't "take it," and so passed out, leaving their share of the picture to their poor relations, the smaller horsetails, that struggled through not only those hard times but all that followed, and are still with us.

The same story could be told about a dozen families of mammals that appeared on the scene much later. Elephants will do as a type example. The earliest ancestral elephants we know anything about were animals not much bigger than a pig, without the later trunk and tusk development.

They grew and grew in succeeding geologic periods, until just prior to and during the last great glacial epoch they were beasts more than a dozen feet high at the shoulders, with tremendous curved tusks.

But they all went, with the exception of the two surviving species in Asia and Africa. And these, even without the deadly interference of man, must surely have followed their forefathers before many more thousands of years.

The meek always inherit the earth.

Science News Letter, December 13, 1952